Claims

1. Procedure for the detection of stress state, wherein ambulatory heart beat signal is measured, characterized in that
   - segments are defined from heart beat signal with a chosen rule for segmentation, and
   - at least one segment describing a physiological state with elevated cardiac activity due to physical workload and/or increased metabolic rate is identified and excluded, if exists, and
   - segments other than the excluded segments are detected for a potential stress state, which is identified using a predetermined rule for the heart beat signal.

2. Procedure according to Claim 1, characterized in that the first chosen rule is used to identify state and period of one or more following: exercise, physical activity, movement, recovery from exercise and postural changes.

3. Procedure according to Claim 1 or 2, characterized in that the second chosen rule comprises procedure to identify internally coherent segments from heart beat signal.

4. Procedure according to claim 1, 2, or 6, characterized in that detected segments are used for correcting heart rate based oxygen- and energy consumption estimate.

5. Procedure according to claim 1 or 2, characterized in that an index representing a summary of the existence and level of stress, relaxation and/or resources for a chosen period of measurement, is determined.

6. Procedure according to claim 1, characterized in that stress and relaxation are measured on the basis of heart period measurement, wherein information on the length of detected relaxation and length of detected stress is used as informative in the detection and quantification of relaxation and stress states

7. Procedure according to any of the claims 1 – 6, characterized in that information on the exercise, physical activity, movement, or postural changes is obtained from heart beat signal and at least one separate input.

8. Procedure according to claim 1 or 2, characterized in that the stress state is defined with the formula:

$$STRpow = E\left(\frac{HR \cdot CT}{HFpow \cdot LFpow}\right)$$

wherein *HR* denotes heart rate level, *CT* denotes inconsistencies in the frequency distribution of HRV due to changes in respiratory period, or alternatively, variability in the respiratory signal. *HFpow* and *LFpow* denote spectral powers in the HF and LF regions of the HRV, respectively.

9. Procedure according to claim 1 or 2, characterized in that the relaxation index is defined by the formula:

$$RLXpow = E(\frac{HFpow}{HR})$$

wherein is *HR* denotes heart rate level,. *HFpow* denotes spectral powers in the HF regions of the HRV.

10. Procedure according to claim 1 or 2, characterized in that the total resources index is defined by the formula:

$$Total\_resources = c_1 \cdot \frac{T_R}{T} \cdot RLXpow - c_2 \cdot \frac{T_S}{T} \cdot STRpow$$

where c_1 and c_2 are scaling constants, T is total time of the measurement, Tr is time classified as relaxation, Ts is time classified as stress, RLXpow the intensity of relaxation state and STRpow is the intensity of stress state.

11. Procedure according to one of claims 1 – 10, characterized in that the procedure is used in a wearable computer.

12. Procedure according to one of claims 1 – 10, characterized in that the procedure is used in a fitness exercise equipment.

13. Procedure according to one of claims 1 - 10, characterized in that the procedure is used in a PC-software.

14. Procedure according to one of claims 1 - 10, characterized in that the procedure is used in a ECG/pulse-monitoring equipment.